

REMARKS

In view of the following discussion, the applicants submit that none of the claims now pending in the application are anticipated under the provisions of 35 U. S. C. § 102, or obvious under the provisions of 35 U. S. C. § 103. Furthermore, the applicants believe that all of the claims satisfy the requirements of 35 U. S. C. § 101. Thus, the applicants believe that all of these claims are in allowable form.

RESTRICTION

Restriction to one of the following inventions is allegedly required under 35 U. S. C. § 121:

Group I. Claims 1-7.

Group II. Claims 8-14.

An election, without traverse, to prosecute the invention of Group I, claims 1-7 has been previously made as indicated in the Office Action. The election is hereby affirmed. However, the applicant still reserves the right to file subsequent applications to prosecute the claims of Group II.

REJECTIONS

A. Double Patenting

1. Claims 1 and 4-7

Claims 1 and 4-7 stand provisionally rejected under 35 U. S. C. § 101 as claiming the same invention as claims 1-5 of Thaler et al. (co-pending application Serial No.

09/745,784 published as US2002/0079811 A1 on June 27, 2002). Applicants respectfully traverse this rejection.

Claim 1 is directed to a cathode-ray tube 10 comprising a focus mask 25 and a screen 22 (see, FIG. 1 and the specification at page 3, line 30 to page 4, line 32). The focus mask 25 includes a plurality of first conductive metal strands 40 (see, FIGS. 4-6 and the specification at page 5, lines 24-25). A plurality of second conductive metal wires 60 are disposed perpendicular to the first conductive metal strands 40 (see, FIGS. 4-6 and the specification at page 6, lines 26-29). The second conductive metal wires 60 are spaced from the first conductive metal strands 40 by an insulator 62 (see, FIGS. 4-6 and the specification at page 6, lines 26-32). The insulator is formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  (see, specification at page 7, line 21 to page 8, line 7).

Thaler et al. discloses a cathode-ray tube 10 comprising a focus mask 25 and a screen 22 (see, Thaler et al. at FIG. 1 and page 1, paragraph 18 to page 2, paragraph 20). The focus mask 25 includes a plurality of electrodes 40, 60 separated from one another by an insulator 62 (see, Thaler et al. at FIGS. 4-6 and page 2, paragraphs 24-29). The insulator 62 is formed of a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof (see, Thaler et al. at page 2, paragraph 30 to page 3, paragraph 33). The one or more transition metal oxides in the insulating material are within a range of about 2 % by weight to about 12 % by weight (see, Thaler et al. at page 3, paragraph 32). The lead-zinc-borosilicate glass is SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form a SCC-11-like glass (see, Thaler et al. at page 3, paragraph 34). The one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder (see, Thaler et al. at page 3, paragraph 31).

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ . Rather, Thaler et al. teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ , claim 1 is patentable over Thaler et al.

Claim 4 depends indirectly from claim 1 and recites a limitation that the low porosity lead-zinc-borosilicate glass insulator includes one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Applicants respectfully traverse this rejection.

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Rather, Thaler et al. only teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium

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oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof, claim 4 is patentable over Thaler et al.

Claim 5 depends indirectly from claim 1 and recites a limitation that the low porosity lead-zinc-borosilicate glass insulator includes one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight. Applicants respectfully traverse this rejection.

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight. Rather, Thaler et al. only teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof within a range of about 2 % by weight to about 12 % by weight. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight, claim 5 is patentable over Thaler et al.

Claim 6 depends indirectly from claim 1 and recites a limitation that the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron

and silicon oxides melted together to form an SCC-11-like glass. Applicants respectfully traverse this rejection.

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  wherein the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass. Rather, Thaler et al. only teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof, wherein the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  wherein the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass, claim 6 is patentable over Thaler et al.

Claim 7 depends indirectly from claim 1 and recites a limitation that one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or by mixing them with the lead-zinc-borosilicate glass powder. Applicants respectfully traverse this rejection.

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and wherein the one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder. Rather, Thaler et al. only teaches a focus mask

including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof, wherein the one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about  $1\text{ }\mu\text{m}$  wherein the one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder, claim 7 is patentable over Thaler et al.

2. Claim 1

Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of co-pending application Serial No. 09/741,541.

In response, the applicants file the accompanying terminal disclaimer to obviate this rejection.

As such, the applicants respectfully request that this rejection of claim 1 be withdrawn.

3. Claim 1

Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of co-pending application Serial No. 09/800,234.

In response, the applicants file the accompanying terminal disclaimer to obviate this rejection.

As such, the applicants respectfully request that this rejection of claim 1 be withdrawn.

4. Claims 1 and 3-4

Claims 1 and 3-4 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1, 3 and 7-8 of co-pending application Serial No. 09/746,242.

In response, the applicants file the accompanying terminal disclaimer to obviate this rejection.

As such, the applicants respectfully request that this rejection of claims 1, 3 and 7-8 be withdrawn.

B. 35 U. S. C. § 102

1. Claims 1 and 3-7 are not anticipated by Nosker et al.

Claims 1 and 3-7 stand rejected under 35 U. S. C. § 102(b) as being anticipated by Nosker et al. (U. S. Patent 5,646,478 issued July 8, 1997). The applicants submit that these claims are not anticipated by this reference.

Claim 1 is directed to a cathode-ray tube 10 comprising a focus mask 25 and a screen 22 (see, FIG. 1 and the specification at page 3, line 30 to page 4, line 32). The focus mask 25 includes a plurality of first conductive metal strands 40 (see, FIGS. 4-6 and the specification at page 5, lines 34-25). A plurality of second conductive metal wires 60 are disposed perpendicular to the first conductive metal strands 40 (see, FIGS. 4-6 and the specification at page 6, lines 26-29). The second conductive metal wires 60 are spaced from the first conductive metal strands 40 by an insulator 62 (see, FIGS. 4-6 and

the specification at page 6, lines 26-32). The insulator is formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  (see, specification at page 7, line 21 to page 8, line 7).

Nosker et al. describes a cathode-ray tube 10 comprising a focus mask 25 and a screen 22 (see, Nosker et al. at FIG. 1 and column 3, lines 2-6). The focus mask 25 includes a plurality of first metal strands 40 (see, Nosker et al. at FIG. 4 and column 3, lines 31-33). A plurality of second metal strands 60 are disposed perpendicular to the first metal strands 40 and are spaced therefrom by an insulator 62 (see, Nosker et al. at FIG. 4 and column 3, lines 63-66). The insulator 62 is formed of a devitrifying glass that electrically isolates the second metal strands 60 from the first metal strands 40 (see, Nosker et al. at FIGS. 4-5 and column 4, lines 20-31). The devitrifying glass is a lead-zinc-borosilicate glass, SCC-11 (see, Nosker et al. at column 5, lines 8-13). A non-devitrifying solder glass layer 66 comprising 80 weight % lead oxide, 5 weight % zinc oxide, 14 weight % boron oxide, 0.75 weight % tin oxide and optionally 0.25 weight % cobalt oxide is coated on the insulator 62 (see, Nosker et al. at FIG. 6 and column 5, lines 14-19).

Nosker et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ . Rather, Nosker et al. only teaches a focus mask including a plurality of second metal strands disposed perpendicular to a plurality of first metal strands and isolated therefrom by a devitrifying lead-zinc-borosilicate glass. Since Nosker et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ , claim 1 is patentable over Nosker et al.

Claim 3 depends directly from claim 1 and recites a limitation that the low porosity lead-zinc-borosilicate glass includes one or more transition metal oxides. The Examiner indicates that Nosker et al. discloses the lead-zinc-borosilicate glass including transition metal oxides. Applicants respectfully traverse this rejection.

Nosker et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by



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an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and which includes one or more transition metal oxides. Rather, Nosker et al. only teaches a focus mask including a plurality of second metal strands disposed perpendicular to a plurality of first metal strands and isolated therefrom by a devitrifying lead-zinc-borosilicate glass having a non-devitrifying solder glass layer comprising 80 weight % lead oxide, 5 weight % zinc oxide, 14 weight % boron oxide, 0.75 weight % tin oxide and optionally 0.25 weight % cobalt oxide coated thereon. Since Nosker et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and which includes one or more transition metal oxides, claim 3 is patentable over Nosker et al.

Claim 4 depends from claim 3 and recites a limitation that the one or more transition metal oxides are selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. The applicants respectfully traverse this rejection.

Nosker et al. does not describe or suggest a focus mask including a plurality of first conductive strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Rather, Nosker et al. only teaches a focus mask including a plurality of second metal strands disposed perpendicular to a plurality of first metal strands and isolated therefrom by a devitrifying lead-zinc-borosilicate glass having a non-devitrifying solder glass layer comprising 80 weight % lead oxide, 5 weight % zinc oxide, 14 weight % boron oxide, 0.75 weight % tin oxide and

optionally 0.25 weight % cobalt oxide coated thereon. Since Nosker et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium

oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof, claim 4 is patentable over Nosker et al.

Claim 5 depends from claim 3 and recites a limitation that the low porosity lead-zinc-borosilicate glass insulator includes the one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight. Applicants respectfully traverse this rejection.

Nosker et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight. Rather, Nosker et al. only teaches a focus mask including a plurality of second metal strands disposed perpendicular to a plurality of first metal strands and isolated therefrom by a devitrifying lead-zinc-borosilicate glass having a non-devitrifying solder glass layer comprising 80 weight % lead oxide, 5 weight % zinc oxide, 14 weight % boron oxide, 0.75 weight % tin oxide and optionally 0.25 weight % cobalt oxide coated thereon. Since Nosker et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight, claim 5 is patentable over Nosker et al.

Claim 6 depends from claim 3 and recites a limitation that the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass. Applicants respectfully traverse this rejection.

Nosker et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  wherein the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form

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an SCC-11-like glass. Rather, Nosker et al. only teaches a focus mask including a plurality of second metal strands disposed perpendicular to a plurality of first metal strands and isolated therefrom by a devitrifying lead-zinc-borosilicate glass wherein the devitrifying lead-zinc-borosilicate glass is SCC-11. Since Nosker et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  wherein the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass, claim 6 is patentable over Nosker et al.

Claim 7 depends from claim 3 and recites a limitation that one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or by mixing them with the lead-zinc-borosilicate glass powder. Applicants respectfully traverse this rejection.

Nosker et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and wherein the one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder. Rather, Nosker et al. only teaches a focus mask including a plurality of second metal strands disposed perpendicular to a plurality of first metal strands and isolated therefrom by a devitrifying lead-zinc-borosilicate glass. Since Nosker et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  wherein the one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by

premelting or mixing them with the lead-zinc-borosilicate glass powder, claim 7 is patentable over Nosker et al.

2. Claims 1 and 4-7 are not invented by Thaler et al.

Claims 1 and 4-7 stand rejected under 35 U. S. C. § 102(f) as being invented by Thaler et al. (co-pending application Serial No. 09/745,784 published as US2002/0079811 A1 on June 27, 2002). Applicants respectfully traverse this rejection.

Claim 1 is directed to a cathode-ray tube 10 comprising a focus mask 25 and a screen 22 (*see*, FIG. 1 and the specification at page 3, line 30 to page 4, line 32). The focus mask 25 includes a plurality of first conductive metal strands 40 (*see*, FIGS. 4-6 and the specification at page 5, lines 24-25). A plurality of second conductive metal wires 60 are disposed perpendicular to the first conductive metal strands 40 (*see*, FIGS. 4-6 and the specification at page 6, lines 26-29). The second conductive metal wires 60 are spaced from the first conductive metal strands 40 by an insulator 62 (*see*, FIGS. 4-6 and the specification at page 6, lines 26-32). The insulator is formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  (*see*, specification at page 7, line 21 to page 8, line 7).

Thaler et al. discloses a cathode-ray tube 10 comprising a focus mask 25 and a screen 22 (*see*, Thaler et al. at FIG. 1 and page 1, paragraph 18 to page 2, paragraph 20). The focus mask 25 includes a plurality of electrodes 40, 60 separated from one another by an insulator 62 (*see*, Thaler et al. at FIGS. 4-6 and page 2, paragraphs 24-29). The insulator 62 is formed of a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof (*see*, Thaler et al. at page 2, paragraph 30 to page 3, paragraph 33). The one or more transition metal oxides in the insulating material are within a range of about 2 % by weight to about 12 % by weight (*see*, Thaler et al. at page 3, paragraph 32). The lead-zinc-borosilicate glass is SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form a SCC-11-like glass (*see*, Thaler et al. at page 3, paragraph 34). The one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder (*see*, Thaler et al. at page 3, paragraph 31).

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ . Rather, Thaler et al. teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ , claim 1 is patentable over Thaler et al.

Claim 4 depends indirectly from claim 1 and recites a limitation that the low porosity lead-zinc-borosilicate glass insulator includes one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Applicants respectfully traverse this rejection.

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Rather, Thaler et al. only teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof. Since

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Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof, claim 4 is patentable over Thaler et al.

Claim 5 depends indirectly from claim 1 and recites a limitation that the low porosity lead-zinc-borosilicate glass insulator includes one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight. Applicants respectfully traverse this rejection.

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further including one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight. Rather, Thaler et al. only teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof within a range of about 2 % by weight to about 12 % by weight. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and further

including one or more transition metal oxides within a range of about 2 % by weight to about 12 % by weight, claim 5 is patentable over Thaler et al.

Claim 6 depends indirectly from claim 1 and recites a limitation that the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass. Applicants respectfully traverse this rejection.

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  wherein the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass. Rather, Thaler et al. only teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and  $\text{Fe}_3\text{O}_4$ ), titanium oxide ( $\text{TiO}_2$ ), zinc oxide ( $\text{ZnO}$ ), molybdenum oxide ( $\text{MoO}_3$ ), chromium oxide ( $\text{Cr}_2\text{O}_3$ ), tin oxide ( $\text{SnO}_2$ ), nickel oxide ( $\text{NiO}$ ), and combinations thereof, wherein the low porosity lead-zinc borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  wherein the low porosity lead-zinc-borosilicate glass is either SCC-11 or a mixture of lead, zinc, boron and silicon oxides melted together to form an SCC-11-like glass, claim 6 is patentable over Thaler et al.

Claim 7 depends indirectly from claim 1 and recites a limitation that one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or by mixing them with the lead-zinc-borosilicate glass powder. Applicants respectfully traverse this rejection.

Thaler et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$  and wherein the one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder. Rather, Thaler et al. only teaches a focus mask including a plurality of electrodes separated from one another by a partially or slightly conductive insulating material comprising lead-zinc-borosilicate glass and one or more transition metal oxides selected from the group consisting of iron oxide ( $\text{Fe}_2\text{O}_3$  and

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Fe<sub>3</sub>O<sub>4</sub>), titanium oxide (TiO<sub>2</sub>), zinc oxide (ZnO), molybdenum oxide (MoO<sub>3</sub>), chromium oxide (Cr<sub>2</sub>O<sub>3</sub>), tin oxide (SnO<sub>2</sub>), nickel oxide (NiO), and combinations thereof, wherein the one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder. Since Thaler et al. does not teach use of an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu$ m wherein the one or more transition metal oxides are added to the lead-zinc-borosilicate glass either by premelting or mixing them with the lead-zinc-borosilicate glass powder, claim 7 is patentable over Thaler et al.

C. 35 U. S. C. § 103

1. Claim 2 is not obvious over Nosker et al.

Claim 2 stands rejected under 35 U. S. C. § 103(a) as being unpatentable over Nosker et al. (U. S. Patent 5,646,478 issued July 8, 1997). In this response, claim 2 has been cancelled and claim 1 has been amended to incorporate the limitation of claim 2. As such, the applicants submit that claim 1 is not rendered obvious by this reference.

Claim 1 is directed to a cathode-ray tube 10 comprising a focus mask 25 and a screen 22 (see, FIG. 1 and the specification at page 3, line 30 to page 4, line 32). The focus mask 25 includes a plurality of first conductive metal strands 40 (see, FIGS. 4-6 and the specification at page 5, lines 34-25). A plurality of second conductive metal wires

60 are disposed perpendicular to the first conductive metal strands 40 (see, FIGS. 4-6 and the specification at page 6, lines 26-29). The second conductive metal wires 60 are spaced from the first conductive metal strands 40 by an insulator 62 (see, FIGS. 4-6 and the specification at page 6, lines 26-32). The insulator is formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu$ m (see, specification at page 7, line 21 to page 8, line 7). Such median particle size less than about 1  $\mu$ m reduces radiation damage to the insulator (see, specification at page 8, lines 8-13) and also minimizes initiation points for high voltage breakdown (see, specification at



page 8, lines 14-19). Furthermore, SCC-11 lead-zinc-borosilicate glass powder has a median particle size of about 3.5  $\mu\text{m}$ , as purchased (*see*, specification at page 9, lines 5-6). The SCC-11 lead-zinc-borosilicate glass powder is milled to reduce the median particle size to less than about 1  $\mu\text{m}$  (*see*, specification at page 9, lines 6-8).

Nosker et al. describes a cathode-ray tube 10 comprising a focus mask 25 and a screen 22 (*see*, Nosker et al. at FIG. 1 and column 3, lines 2-6). The focus mask 25 includes a plurality of first metal strands 40 (*see*, Nosker et al. at FIG. 4 and column 3, lines 31-33). A plurality of second metal strands 60 are disposed perpendicular to the first metal strands 40 and are spaced therefrom by an insulator 62 (*see*, Nosker et al. at FIG. 4 and column 3, lines 63-66). The insulator 62 is formed of a devitrifying glass that electrically isolates the second metal strands 60 from the first metal strands 40 (*see*, Nosker et al. at FIGS. 4-5 and column 4, lines 20-31). The devitrifying glass is a lead-zinc-borosilicate glass, SCC-11 (*see*, Nosker et al. at column 5, lines 8-13).

Nosker et al. does not describe or suggest a focus mask including a plurality of first conductive metal strands separated from a plurality of second conductive metal wires by an insulator formed of a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ . Rather, Nosker et al. only teaches a focus mask including a plurality of second metal strands disposed perpendicular to a plurality of first metal strands and isolated therefrom by a devitrifying lead-zinc-borosilicate glass, SCC-11. Since Nosker et al. does not teach use of an insulator formed of a low porosity

lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ , claim 1 is patentable over Nosker et al.

## CONCLUSION

Thus, the applicants submit that none of the claims, presently in the application, are anticipated under the provisions of 35 U. S. C. § 102, or obvious under the provisions of 35 U. S. C. § 103. Furthermore, the applicants believe that all of these claims satisfy the requirements of 35 U. S. C. § 101. Consequently, the applicants believe that all of the

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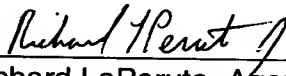
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claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested that the Examiner telephone Mr. Richard LaPeruta, at (717) 295-6207, so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,



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Patent Operation

Thomson Licensing Inc.

P.O. Box 5312

Princeton, NJ 08543-5312

March 31, 2003

**VERSION WITH MARKINGS TO SHOW CHANGES MADE**

1. (Currently Amended) A cathode-ray tube comprising an evacuated envelope having therein an electron gun for generating at least one electron beam, a faceplate panel having a luminescent screen with phosphor elements on an interior surface thereof, and a focus mask, wherein the focus mask includes a plurality of spaced-apart first conductive strands having an insulating material thereon, and a plurality of spaced-apart second conductive wires oriented substantially perpendicular to the plurality of spaced-apart first conductive strands, the plurality of spaced-apart second conductive wires being bonded to the insulating material, wherein the insulating material comprises a low porosity lead-zinc-borosilicate glass powder having a median particle size less than about 1  $\mu\text{m}$ .

2. (Cancelled)

8-14. (Withdrawn)

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IN THE SPECIFICATION

Please rewrite the title on page 1, lines 1-2 as indicated as follows:

**CATHODE-RAY TUBE HAVING A FOCUS MASK WITH IMPROVED**  
**INSULATOR PERFORMANCE**  
**~~METHODS TO IMPROVE INSULATOR PERFORMANCE FOR~~**  
**~~CATHODE-RAY TUBE (CRT) APPLICATIONS~~**